Indian Maritime University

(A Central University, Govt. Of India)

B. Tech(Marine Engineering)

Semester IV

DEC-2019/JAN-2020 End Semester Examination

ELECTRICAL MACHINES II

(UG11T3404)

Date:07-01-2020	Max Marks:**70**
Time:3 Hrs	Pass Marks: **35**

Part – A (compulsory)

Answer the following (10x2=20 Marks)

1. Define slip of an induction motor. Give the mathematical expression of percentage slip.
2. List out the different methods of starting three phase induction motors.
3. Draw the circuit diagram of single-phase induction motor.
4. What are the types of three-phase alternators based on rotor construction?
5. Mention the conditions for paralleling alternator with infinite bus bar.
6. What is hunting in synchronous machines? State its effects.
7. What you mean by synchronous condenser? State its use.
8. Compare the synchronous motor with induction motor in terms of speed, power factor, and excitation.
9. What are the types of stepper motor? Define step angle.
10. Give the applications of synchros.

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

11. The power input to the rotor of a 440 V, 50-Hz, 6-pole, 3-phase induction motor is 100 kW. The rotor frequency is 2 cycles per second. Calculate (i) the slip, (ii) the rotor speed, (iii) mechanical power developed, (iv) the rotor copper loss per phase and (v) speed of stator field with respect to rotor.

12. Explain the construction of circle diagram of induction motor with systematic procedure and hence deduce the performance parameters.

13. Explain the starting of three-phase induction motor using autotransformer and star-delta starters.

14. Explain the characteristics and working of shaded pole motor with neat schematic.

15. (a) Derive the e.m.f. equation of alternators.

(b) What is meant by voltage regulation of alternator? List out the factors governing voltage regulation.

16. Derive an expression for the power developed by a synchronous motor and deduce the expression for the gross torque.

17. Explain the construction and working of AC servomotor.

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